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Sero-epidemiology of major blood-borne infections among first time blood donors in Edea, Cameroon

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Background: Blood safety remains an issue of major concern in transfusion medicine in sub-Saharan Africa. Blood-borne agents such as the human immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis C virus (HCV), and Treponema pallidum are among the greatest threats to blood safety for the recipient. This study aimed at determining the seroprevalence and risk factors of HIV, HCV, HBV, and syphilis infections among first-time blood donors of a Cameroonian hospital-based blood bank

Methods & Materials We undertook a retrospective analysis of blood donor data recorded between December 2011 and May 2012 at the blood bank of the Edea's Regional Hospital. Antibodies to HIV types 1 and 2 were screened with the Determine and ImmunoComb tests. Hepatitis B surface antigen and antibodies to HCV were detected using DIASpot test strips. Syphilis was diagnosed using the Venereal Disease Research Laboratory (VDRL) test and the Treponema pallidum hemagglutination assay (TPHA)

Results A total of 543 blood donors were enrolled, including 349 (64.3%) family replacement donors. One hundred and fifteen donors (21.2%) were infected with at least one pathogen. The overall seroprevalence rates of HIV, HBV, HCV, and syphilis were 4.1%, 10.1%, 4.8%, and 5.7%, respectively. We found a total of 26 dual infections. The most common combinations were HBV–HCV and HBV–HIV. There was a significant association between HIV and HBV infections (adjusted odds ratio (aOR) 3.46, 95% CI 1.29–9.39; p = 0.014), and between HBV and HCV infections (aOR 2.81, 95% CI 1.02–10.12; p = 0.036). Compared to voluntary donors, family replacement donors were significantly more infected by at least one screened pathogen (aOR 1.81, 95% CI 1.14–2.88; p = 0.013), and more infected specifically by HIV (aOR 3.66, 95% CI 1.07–12.55; p = 0.039) and syphilis (aOR 2.81, 95% CI 1.05–7.46; p = 0.039).

Conclusion Our findings indicate that blood safety remains a major problem in Cameroon where hospital-based blood banks and family replacement donors are predominant. There is an urgent need for a national blood transfusion program advocating a nationally coordinated blood transfusion service based on the principles of voluntary regular non-remunerated blood donations.

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Comparison of quantitative real-time PCR assay and direct immunofluorescence test for the detection of P. jirovecii infection versus colonisation

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Background: *Pneumocystis* pneumonia (PCP) is extremely prevalent in HIV-positive patients. Asymptomatic infection or colonisation with *P. jirovecii* has been shown to occur frequently. Due to the high sensitivity of PCR assays, they frequently identify colonisation in addition to infection, which may make the results difficult to interpret. DNA copy number/Ct value cut-offs to differentiate colonisation and infection, using quantitative real-time PCR (qPCR) assays, have been suggested but need to be standardised for routine use. We compared the results of qPCR with a conventional direct immunofluorescence assay (DFA) to determine a possible cut-off.

Methods & Materials: For the period March 2005 through June 2009, induced sputum specimens were collected from adult patients who were clinically suspected of having PCP, at the Chris Hani Baragwanath Hospital in Gauteng, South Africa. Laboratory diagnosis of PCP was made using the Light Diagnostics DFA Kit and a qPCR assay targeting a region coding for the mitochondrial large subunit rRNA. ROC curve analysis was performed to determine a suitable cut-off value.

Results: Three hundred and six specimens were collected and tested. *P. jirovecii* was identified in 51% (156/306) and 67% (205/306) of specimens using DFA and qPCR, respectively. The qPCR had a sensitivity and specificity of 98% and 70%, respectively, compared with the DFA. There were three DFA-positive samples which were qPCR negative and 41 DFA-negative samples that were qPCR positive. Two of the three DFA-positive samples were positive for PCR inhibition and the third was concluded to be a microscopic misidentification. The cut-off value for the qPCR that best predicted the DFA results was 78 copies/μl (area under ROC curve 0.9187; 95% binomial exact confidence intervals: 0.8814-0.94625).

Conclusion: The results of the ROC curve analysis indicate an excellent predictive value of the PCR using the proposed cut-off. The sensitivity and specificity of PCR using this cut-off are 94.6% and 89.1%, respectively. However, the DFA test is an imperfect gold standard and so this cut-off should not be used in isolation; clinical data should also contribute to the interpretation of the PCR result.

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